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EXAMINER

CHOW, LIXI

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 01/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/806,215

Applicant(s)

AHN ET AL.

Examiner

Lixi Chow

Art Unit

2652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

1. Claims 1-20 are pending in this application.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10/806107. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are relating to information storage medium for having mark and space recorded thereon. Even though, claim 4 of Application No. 10/806107 does not recite "the first state corresponding to a recording pattern of the waveform; and a second state corresponding to an erase pattern of the waveform"; however, claim 4 of Application No. 10/806107 does recite "a recording waveform comprising a recording pattern, and erase pattern..." The NRZI data signal output from the modulation unit corresponds to "the first state is a mark formed by a first level of an NRZI data signal, and the second state is a space formed by a second level of the NRZI data signal" as recited in claim 2 of instant Application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Maeda et al. (US 5,144,601; hereafter Maeda).

Regarding claim 19:

Maeda discloses an information storage medium which stored data recorded using a waveform (see col. 5, lines 19-27), comprising:

a first state corresponding to a recording pattern of the waveform (see Fig. 4D, the larger pulse width is the first state); and

a second state corresponding to an erase pattern of the waveform (see Fig. 4D, the smaller pulse width is the second state), wherein

the erase pattern comprises a multi-pulse having a power level of a leading pulse of the erase pattern set to a high level of the multi-pulse and a power level of the trailing pulse set to a high level of the multi-pulse and the recording pattern and the erase pattern are concatenated by a cooling pulse of the waveform (see Fig. 4D, the leading pulse and trailing pulse of the erase pattern are at high power level).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, 9-13, 16-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara (US 6,396,792).

Regarding claim 1:

Ichihara discloses an information storage medium (Fig. 5, element 11) for storing data using a waveform, comprising:

a first state corresponding to a recording pattern of the waveform (see Figs. 1A-1E; Pa level corresponds to the first state); and

a second state corresponding to an erase pattern of the waveform (see Fig. 1B; Pc1 corresponds to the second state); wherein:

the erase pattern comprises a multi-pulse (see Fig. 1B); and

the recording pattern and the erase pattern are concatenated by a cooling pulse of the waveform (see Fig. 1B; the pulse between erase pulse and record pulse corresponds to the cooling pulse; also, see Col. 5, line 64 to Col. 7, line 8).

Ichihara does not specifically show the erase pattern containing a multi-pulse wherein a leading pulse of the multi-pulse is at the low power level and a trailing pulse of the multi-pulse is at the high power level. However, Ichihara does mention that the power levels for the erase pattern are not limited to those shown in the figure, i.e. Fig. 1B(see col. 6, lines 35-44). In addition, Ichihara suggests a plurality of power levels lower than the recording level (Pa) are acceptable for setting the erase power level (see col. 6, lines 58-61). This suggests that the

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power level of the leading pulse of the multi-pulse erase pattern can be at a low power level and the power level of the trailing pulse of the multi-pulse erase pattern can be at a high power level.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have set the power level of the leading and trailing pulse of the multi-pulse erase pattern in various way as suggested by Ichihara. In particular, it would be obvious for a person with an ordinary skill to have modified the power level of a multi-pulse erase pattern, wherein the leading pulse is at low power level and the trailing pulse is at high power level. One would have been motivated to do this, because optimization of erase power level are different among different type of discs and conditions (see Ichihara, col. 11, lines 16-25; one would have to consider the material of the recording layer and the optical property of the laser in order to determine the optimum erase power level); and the importance of forming erase pulses in various combinations would ensure the entire area in the width direction of the recording track uniformly passes the temperature zone promoting generation of crystal nuclei (see col. 7, lines 1-5).

Regarding claim 2:

Ichihara discloses the information storage medium of claim 1, wherein:

the first state is a mark formed by a first level of an NRZI data signal (see Figs. 1A and 1B; and Col. 4, lines 45-50); and

the second state is a space formed by a second level of the NRZI data signal (see Figs. 1A and 1B).

Regarding Claim 3:

Ichihara discloses the information storage medium of claim 1, wherein:

the recording pattern comprises another multi-pulse (see Fig. 1B, the second portion of the pulse in Pa level); and

the cooling pulse extends from the multi-pulse of the recording pattern to the multi-pulse of the erase pattern (see Fig. 1B and Col. 5, lines 54-61; the pulse between erase pulse and record pulse corresponds to the cooling pulse).

Regarding claim 9:

Ichihara further discloses the erase pattern is recorded sequentially after the recording pattern, the recording pattern comprises another multi-pulse, and a first one of the another multi-pulses of the recording pattern is adjusted to have a power that is other than a power of a first one of the multi-pulses of the erase pattern (see Fig. 1B; the recording pattern is shown in pulse pattern that is at Pa level, which is recorded adjacent to the multi-pulse erase pulses; Pa is at a level that is other than the Pc1 or Pc2).

Regarding claim 10:

Ichihara further discloses the erase pattern is recorded sequentially after the recording pattern, the recording pattern comprises another multi-pulse, and a first one of the another multi-pulses of the recording pattern is adjusted to have a power that is equal to a power of a first one of the multi-pulses of the erase pattern (see col. 6, lines 52-57; Ichihara specifies that if the pulse width of the Pc1 is very short, then the power level of Pc1 may be equal to the power level of the Pa, which is the first one of the multi-pulse of the recording pattern).

Regarding claim 11:

Ichihara further discloses the multi-pulse of the erase pattern has a first pulse power and a second pulse power greater than the first pulse power (see Fig. 1B, the first pulse power is Pc

(the power level of the pulse adjacent to the first pulse of the recording pattern), and the second pulse power is P_{c1}).

Regarding claim 12:

Ichihara does not specifically disclose the power of the first one of the multi-pulses of the erase pattern is equal to the first pulse power. However Ichihara does mention the power levels for the erase pattern are not limited those shown in the figure (see col. 6, lines 35-44). In addition, Ichihara suggests a plurality of power levels lower than the recording level (P_a) are acceptable for setting the erase power level (see col. 6, lines 58-61). This suggests that the power level of the leading pulse of the multi-pulse erase pattern can be equal to the first pulse power which is lower than the second pulse power.

It would be obvious for one of ordinary skill in the art to modify the erase pattern of Ichihara, so that first one of the multi-pulses of the erase pattern is equal to the first pulse power. One would be motivated to do this, because optimization of erase power level are different among different type of discs and conditions (see Ichihara, col. 11, lines 16-25; one would have to consider the material of the recording layer and the optical property of the laser in order to determine the optimum erase power level); and the importance of forming erase pulses in various combination is to ensure the entire area in the width direction of the recording track uniformly passes the temperature zone promoting generation of crystal nuclei (see col. 7, lines 1-5).

Regarding to claim 13:

Ichihara further discloses the multi-pulse of the erase pattern has a first pulse power and a second pulse power greater than the first pulse power (see Fig. 1B, the first pulse power is the P_{c2} and second pulse power is P_{c1}), and the power of the first one of the another multi-pulses of

the recording pattern is equal to the first pulse power (the power level of the recording pattern to record the first mark is equal to the first pulse power P_{c2}).

Regarding claim 16:

Ichihara further discloses the cooling pulse is concatenating and included in the recording and erase patterns and has a cooling power less than a power of a first pulse of the multi-pulse of the erase pattern (see Fig. 1B, the cooling pulse is the off pulse between the recording pattern and the erase pattern).

Regarding claim 17:

Ichihara further discloses the cooling pulse has a cooling power less than the power of the last pulse of the another multi-pulse of the recording pattern and a power of the first pulse of the multi-pulse of the erase pattern (see Fig. 1B; the cooling pulse is the pulse in between the forming of a mark and space; the cooling power is at P_{c2} , the last pulse of the recording pattern is at P_a and the first pulse of the erase pattern is at P_{c1}).

Regarding claim 18:

Ichihara further discloses the cooling pulse has a cooling power less than a recording power of the recording pattern and a power of the first pulse of the multi-pulse of the erase pattern (see Fig. 1B).

Regarding claim 20:

Ichihara discloses an information storage medium which stored data recorded using a waveform, comprising:

a first state corresponding to a recording pattern of the waveform (see Fig. 1B, the recording pattern is the pulse pattern at P_a level); and

a second state corresponding to an erase pattern of the waveform (see Fig. 1B, the erase pattern is the pulse pattern between Pc2-Pc1 level), and

the recording pattern and the erase pattern are concatenated by a cooling pulse of the waveform (see Fig. 1B).

Ichihara discloses almost all the limitations specified by claim 20, except Ichihara does not particularly point out the power levels of the leading and trailing pulses of the erase pattern being a low power level. However, Ichihara does mention the power levels for the erase pattern are not limited to those shown in the figure, i.e., Fig. 1B (see col. 6, lines 35-44). In addition, Ichihara suggests a plurality of power levels lower than the recording level (Pa) are acceptable for setting the erase power level (see col. 6, lines 58-61). This suggests that the power level of the leading pulse of the multi-pulse erase pattern can be at a low power level and the power level of the trailing pulse of the multi-pulse erase pattern can be at a low power level.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have set the power level of the leading and trailing pulse of the multi-pulse erase pattern in various way as suggested by Ichihara. In particular, it would be obvious for a person with ordinary skill to have modified the power level of multi-pulse erase pattern, wherein the leading pulse is at low power level and the trailing pulse is at low power level. One would have been motivated to do this, because optimization of erase power level are different among different type of discs and conditions (see Ichihara, col. 11, lines 16-25; one would have to consider the material of the recording layer and the optical property of the laser in order to determine the optimum erase power level); and the importance of forming erase pulses in various

combination is to ensure the entire area in the width direction of the recording track uniformly passes the temperature zone promoting generation of crystal nuclei (see col. 7, lines 1-5).

8. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara in view of Ushiyama et al. (US 2002/0176338; hereafter Ushiyama).

Regarding claim 4:

Ichihara discloses an information storage medium which stores data recorded using a waveform, comprising:

a first state corresponding to a recording pattern of the waveform (see Fig. 1B, the recording pattern is the pulse pattern at Pa level); and

a second state correspond to an erase pattern of the waveform (see Fig. 1B, the erase pattern is the pulse pattern between Pc2-Pc1 level), wherein:

the recording pattern comprising a first multi-pulse having a plurality of first pulses, the erase pattern comprises a second multi-pulse having a plurality of second pulses (see Fig. 1B).

Ichihara suggests that the pulses in the portion for making marks may be modified (see col. 5, line 67 to col. 6, line 2); however, Ichihara does not specifically disclose the first one of the first pulses of the recording pattern being adjusted according to a property of the last one of the second pulses of the erase pattern. On the other hand, Ushiyama discloses an information storage medium, wherein the optimized pulses width changes its optimized values of the first pulse depending on the property of the space portion located in front of the recording pattern (see Ushiyama, paragraph [0049]). The property of the space portion would inherently include the property of the last one of pulses of the erase pattern.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the first pulse of the recording pattern disclosed by Ichihara so that it is being adjusted according to the property of the last one of the pulses of the erase pattern as taught by Ushiyama. One of ordinary skill in the art would have been motivated to do this, because the optimum pulse value changes according to the property of the space portion located in front of the recording pattern (see Ushiyama, paragraph [0049]). Essentially, the property of the last one of the pulses of the pattern is crucial in determining the optimum pulse value of the first pulse of the recording pattern.

Regarding claim 5:

Ichihara further discloses the waveform comprises of first cooling pulse as a portion of the recording pattern and a second cooling portion as a portion of the erase pattern (see Fig. 1B; the pulse between erase pulse and record pulse corresponds to the cooling pulse).

Regarding claim 6:

Claim 6 recite a similar limitation as claim 4. Hence, claim 6 is rejected based on the same reason set forth in claim 4.

9. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara in view of Clark et al. (US 5,802,031; hereafter Clark). For a description of Ichihara, see the rejection of paragraph 5, above.

Regarding claims 7 and 8:

Ichihara does not disclose the data recorded using the waveform modulated according to a Run Length Limited (RLL) (1,7). However, Clark discloses the recording of data using the

waveform modulated according to a Run Length Limited (RLL) (1,7) (see Clark, col. 6, lines 51-59).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have adopted the method of recording data according to a Run Length Limited (RLL) (1,7) in the medium of Ichihara as taught by Clark. One of ordinary skill in the art would have been motivated to do this, because recording of marks and spaces of length 2T to 8T for standard M-O recording system is possible (see Clark, col. 6, lines 51-59). Hence, recording of marks or spaces amongst different types of recording format can be achieved.

10. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara in view of Tanaka et al. (US 5,825,742; hereafter Tanaka). For a description of Ichihara, see the rejection of paragraph 5, above.

Regarding claims 14 and 15:

Ichihara does not disclose a multi-pulse recording pattern comprising a recording pulse having a power greater than the power of the first one of the pulses of the recording pattern. However, Tanaka discloses a multi-pulses recording pattern comprising a recording pulse having a power greater than the power of the first one of the pulses of the recording pattern (see Tanaka, Fig. 8, Pw2 is greater than the first pulse of the multi-pulses recording pattern).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have adopted the method taught by Tanaka for recording information having a recording power higher than the power of the first one of the pulses of the multi-pulses recording pattern in the medium provided by Ichihara. One would be motivated to do this, so edge shift and jitter of the recording mark can be suppressed (see Tanaka, col. 4, lines 1-22).

Response to Amendment

11. Applicant's arguments filed 11/10/05 have been fully considered but they are not persuasive.

I. Applicant argues Ichihara does not disclose or suggest, "the erase pattern comprises a multi-pulse having with a power level of a leading pulse of the erase pattern set at a low level of multi-pulse and a power level of a trailing pulse of the erase pulse set a high level of the multi-pulse". However, Examiner respectfully disagrees. Although Ichihara does not specifically illustrate in the figures showing the leading pulse of the multi-pulse is at the low power level and a trailing pulse of the multi-pulse is at the high power level. Nevertheless, Ichihara does suggest that plurality of other power levels other than the Pc1 and Pc2 are acceptable for setting as erase power levels (see col. 6, lines 35-61). Given with such suggestion, it would be obvious for a person of ordinary skill in the art to carry out various combination of power level for the leading pulse and the trailing pulses of the multi-pulse erase pattern, thereby capable of determining the optimum erase pattern level for plurality of discs having different recording conditions. Since Ichihara shows the recording and erasing of information that would improve the overwrite erasability of the optical recording medium, one would be motivated to try the different combination of the erase power in order to achieve that goal. Accordingly, claim 1 is not patentable over Ichihara.

II. Applicant's arguments with respect to claim 4 have been considered but are moot in view of the new ground(s) of rejection.

III. In regards to double patenting, rejection under provisional obviousness type double patenting is maintained. Since Application 10/806107 has been amended to include similar new

claims as current Application, provisional obviousness type double patenting is also applicable to the new claims.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lixi Chow whose telephone number is 571-272-7571. The examiner can normally be reached on Mon-Fri, 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A. L. Wellington can be reached on 571-272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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